Currituck Sound Ecosystem Restoration Study Water-Quality Data Collection Efforts

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USGS Project Objectives

- Collect discharge and velocity data at 7 sites in and around the Currituck Sound
- Oversee the collection of discrete water-quality samples and continuous water-quality data at 8 sites in and around the Currituck Sound
- Provide data processing and storage of project water-quality and streamflow data
- Compilation of Relevant Historical Data
- Quality assurance and application of Currituck Sound water-quality model
- Development and testing of watershed models for Tull Creek and West Neck Creek

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Project Partners

- NC Division of Water Resources (funding and project oversight)
- US Army Corps of Engineers (hydrodynamic modeling and project management)
- US Fish and Wildlife – Back Bay National Wildlife Refuge (water-quality data collection)
- Elizabeth City State University (water-quality data collection)
- NC National Estuarine Research Reserve (water-quality data collection)
- UNC Chapel Hill - Institute of Marine Science (project laboratory

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Data Collection (2006-2007)

Site number (fig. 1)	USGS station number	Site name	Mean channel width (feet)	Mean water depth (feet)
4	02043410	Northwest River above mouth near Moyock, NC	477	8.2
5	02043415	Tull Creek at SR 1222 near Currituck, NC	219	7.6
6	0204343500	Intracoastal Waterway at Coinjock, NC	181	19.1
7	02043120	Albemarle & Chesapeake Canal near Princess Anne, VA	226	10.1
14/15	02043460	Currituck Sound off Dews Island near Jarvisburg, NC	~21.000	4.9
20	02043270	North Landing River near Creeds, VA	422	10.6
21	02043016	Back Bay below Ragged Island near Back Bay, VA	~23.000	6.9
23	02043430	Upper Currituck Sound near Corolla, NC	~23.500	3.0
24	0204347500	Currituck Sound at US 158 nr Point Harbor, NC	~14.000	9.0

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Discharge and Velocity Data

- ADVM measured gage height and velocity data at 15 minute intervals.
- Data was transmitted by satellite telemetry every 4 hours.
- Discharge measurements were made to develop a relationship between the ADVM measured velocity and the velocity across the entire stream channel. This relationship is called the mean channel velocity.
- The mean channel velocity, gage height, and measured discharge were used to calculate instantaneous discharge values.
- January 2006 to August 2007

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Site number (fig. 1)	Project partner responsible for data collection			
	Continuous discharge	Continuous water elevation referenced to NAVD 88	Discrete water-quality samples	Continuous water-quality monitoring
4	USGS	USGS	ECSU	ECSU
5	USGS	USGS	ECSU	ECSU
6	USGS	USGS	ECSU	ECSU
7	USGS	USGS	USGS	---
14/15	---	---	ECSU	ECSU
20	USGS	USGS	ECSU	ECSU
21	---	---	USGS	FWS
23	---	---	NEER	NEER
24	---	USGS	NEER	NEER

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Continuous Water-Quality Data

- Water-quality monitor measured temperature, specific conductance, dissolved oxygen, pH, turbidity, and chlorophyll *a* data at 30 minute intervals.
- Data was recorded internally by the monitor.
- Sites were routinely serviced to retrieve the data, install a clean and calibrated monitor, and to collect discrete water-quality samples.
- March 2006 to July 2007

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Discrete Water-Quality Samples

- Discrete water-quality samples were collected each time the monitors were serviced.
- Before sampling, field measurements of secchi depth, temperature, specific conductance, dissolved oxygen, pH, turbidity, and chlorophyll *a* were recorded.
- Samples were processed in the lab and shipped to UNC Institute of Marine Sciences for analysis.
- July 2006 to July 2007

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Quality Assurance and Data Archival

- To ensure a uniform water-quality dataset, the USGS trained the ECSU, NERR, and FWS in data collection and documentation techniques for the collection of continuous water-quality data and water-quality sampling.
- The USGS periodically accompanied the project partners on site visits to provide assistance.
- All of the hydrologic and water-quality data for the project is stored in the USGS National Water Information System database.

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Currituck Project Website

- http://nc.water.usgs.gov/projects/currituck/
- All water-quality data collected for the current project is available through this site with the associated streamflow data.
- All streamflow data collected during the project is available through a request to our office or the NWIS-Web interface (daily values): http://waterdata.usgs.gov/nc/nwis/sw.

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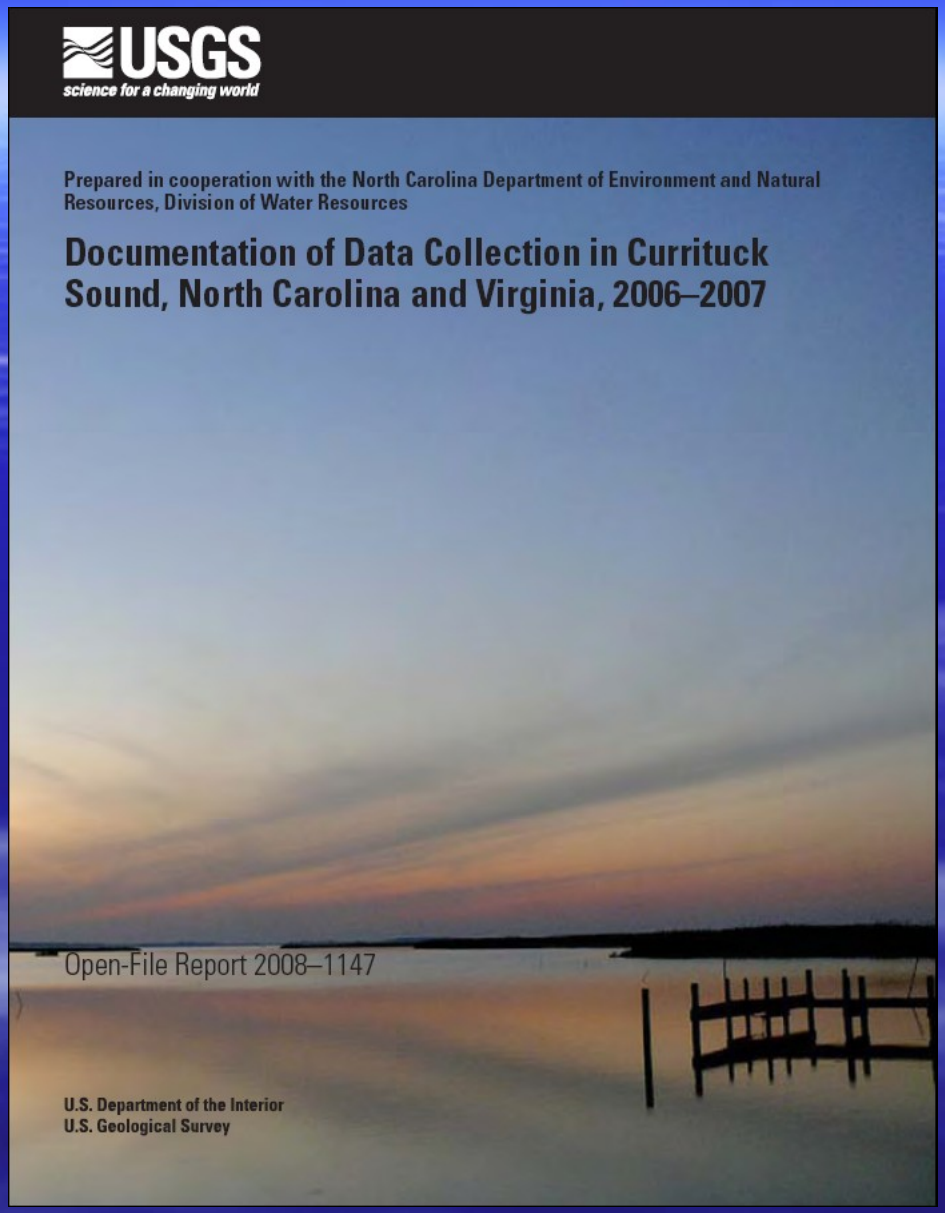
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Prepared in cooperation with the North Carolina Department of Environment and Natural Resources, Division of Water Resources
Documentation of Data Collection in Currituck Sound, North Carolina and Virginia, 2006–2007
Open-File Report 2008–1147
U.S. Department of the Interior
U.S. Geological Survey

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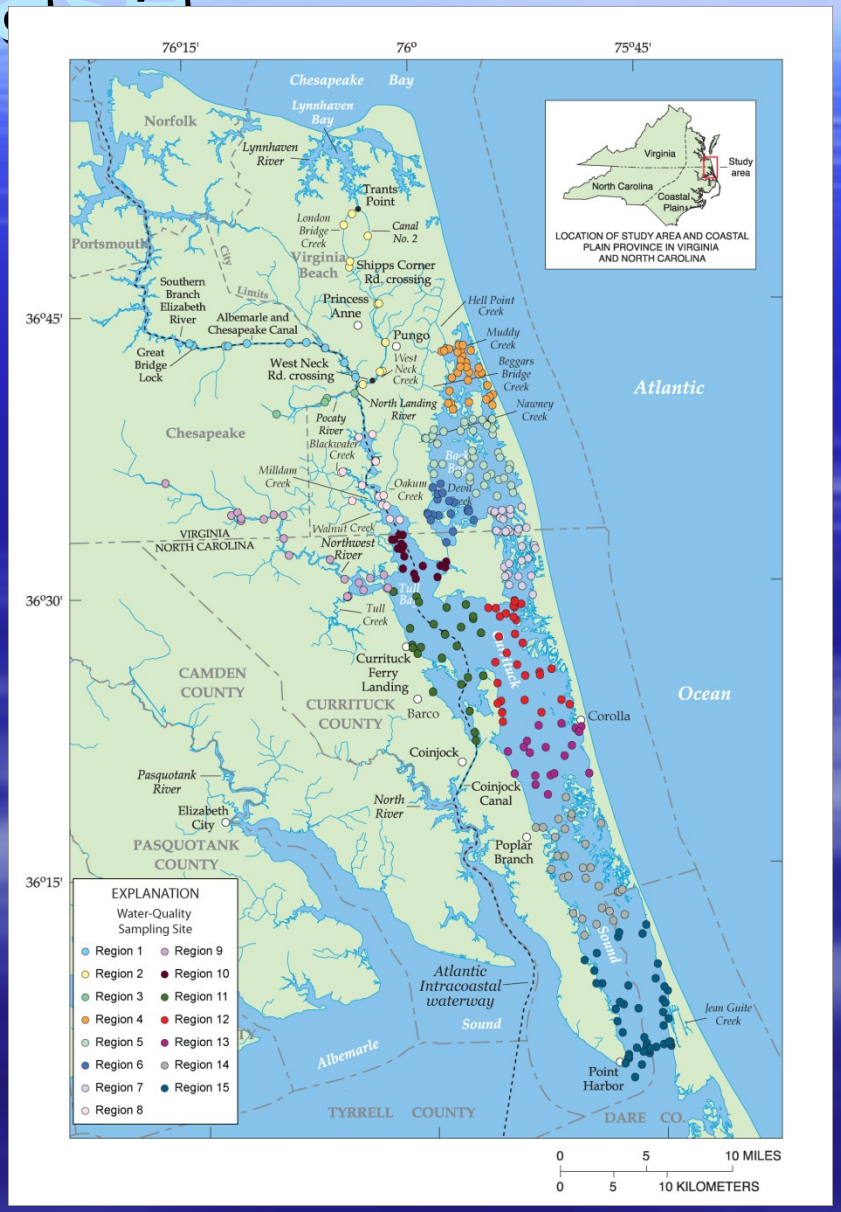
http://pubs.usgs.gov/of/2008/1147/pdf/ofr2008-1147.pdf

Historic Water-Quality Database

- 101,526 unique measurements
- 58 water-quality parameters
- Data collected between 1925 and 2007



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Future USGS Activities

- Oversee, process, and store the current collection of water-quality data by ECSU
- Expand watershed modeling effort to include the entire Currituck Sound basin
- Provide quality assurance for Currituck Sound water-quality model and participate in model testing and application

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